[aaspp4,10pt,epsf]article
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Mapping IR Enhancements in Closely Interacting Spiral-Spiral Pairs. I. ISO CAM and ISO SWS ObservationsBased on observations made with ISO, an ESA project with instruments funded by ESA Member States and with the participation of ISAS and NASA.

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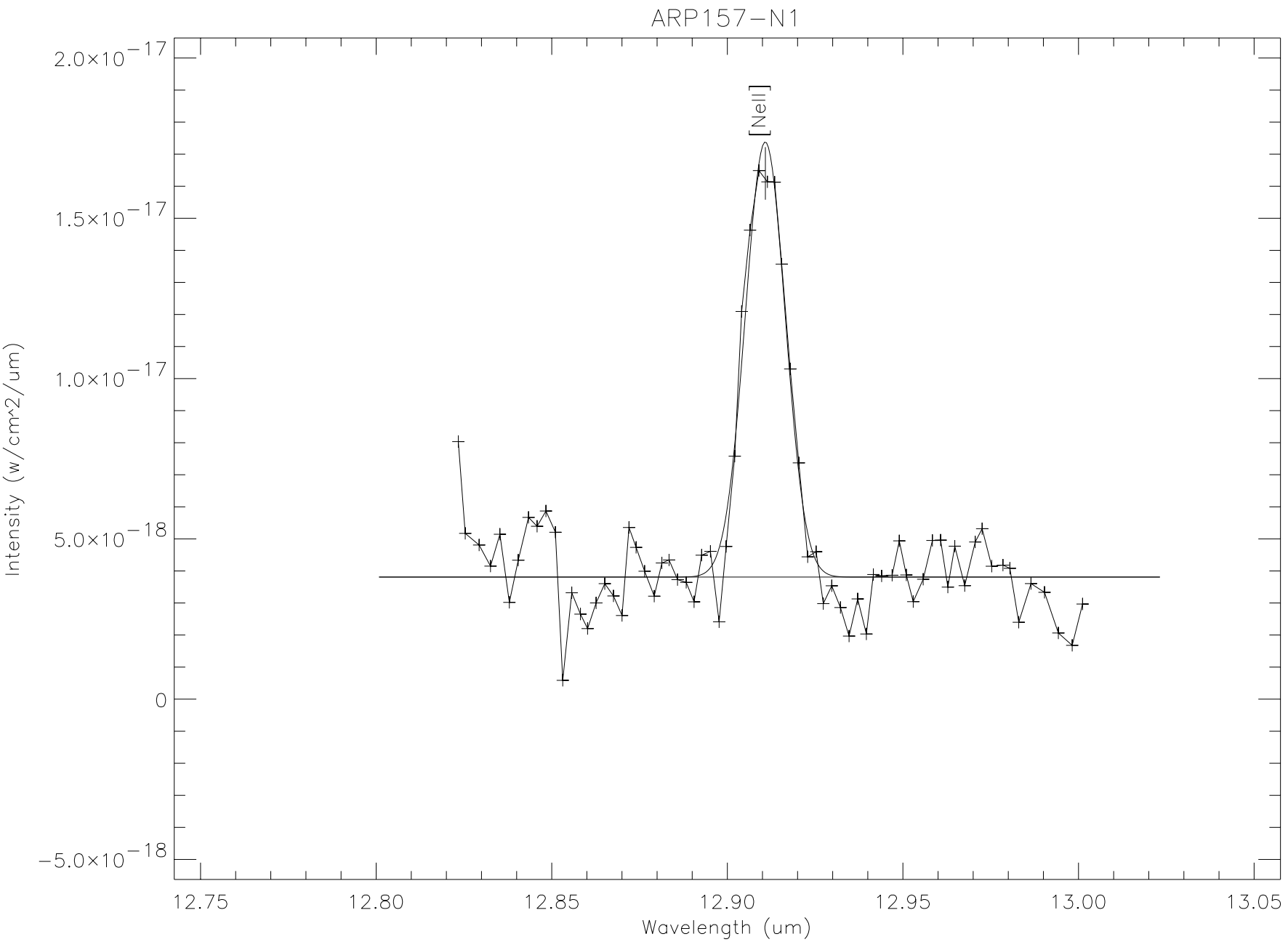
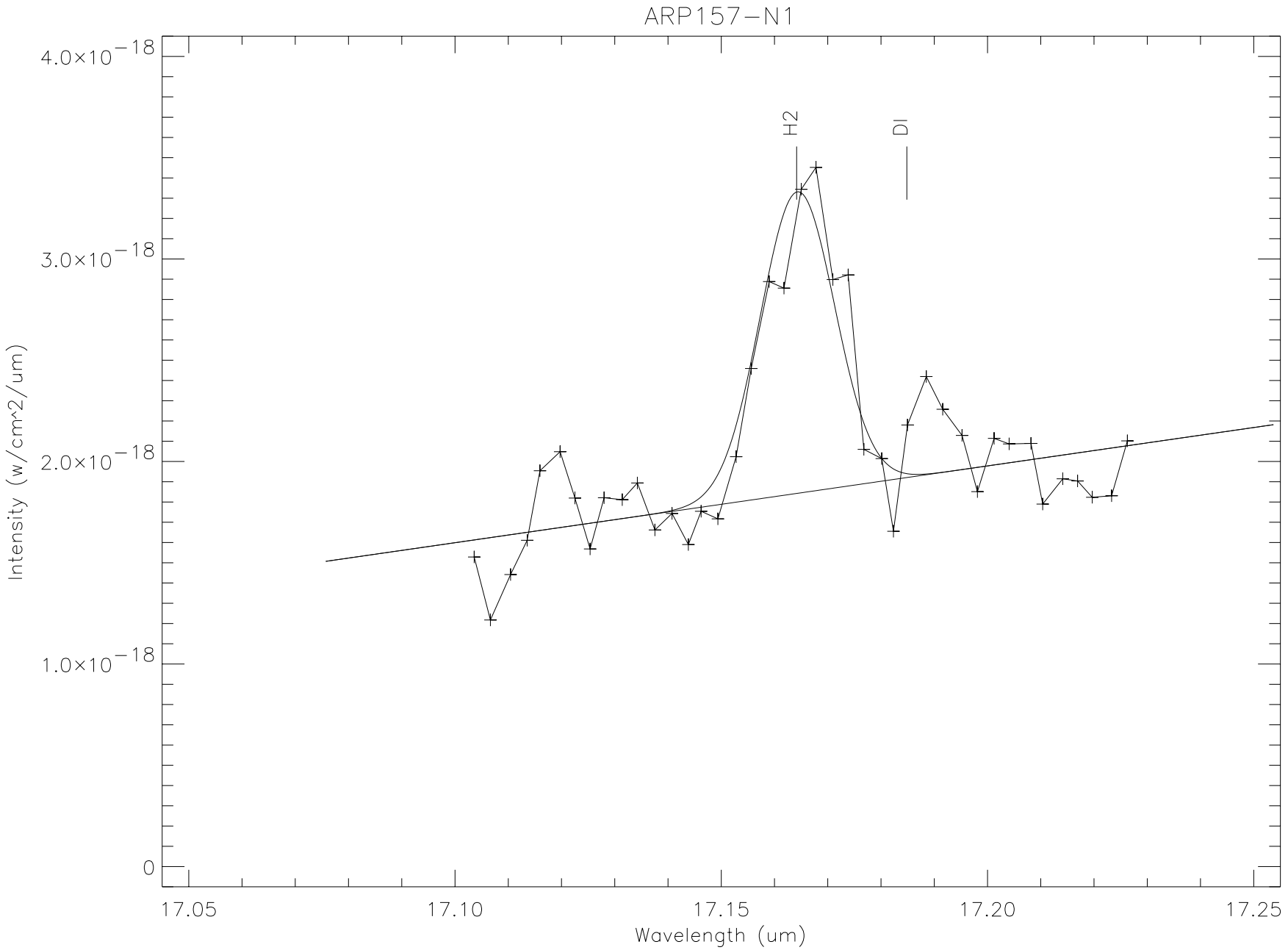
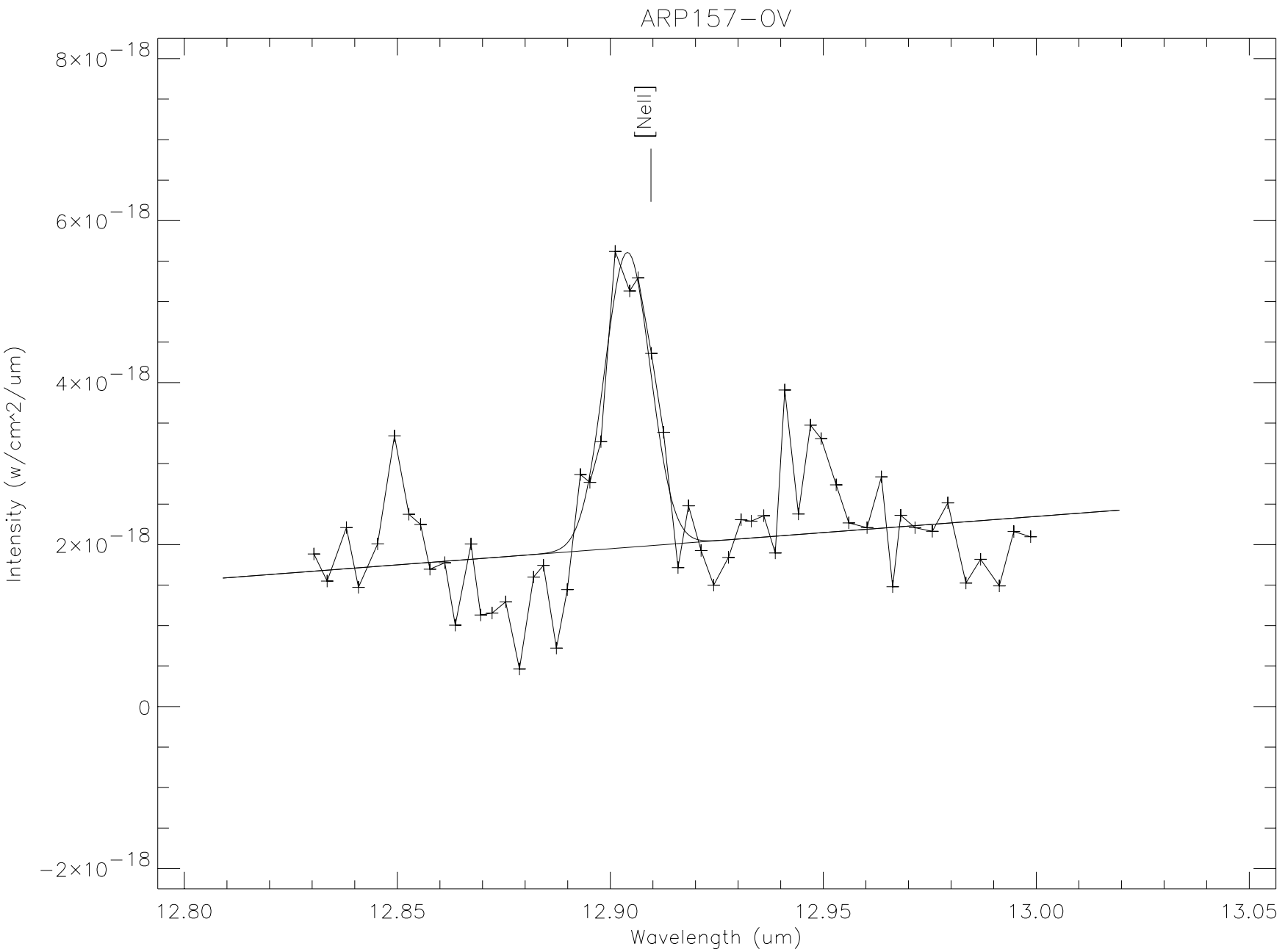
abstract Mid-infrared (MIR) imaging and spectroscopic observations are presented for a well defined sample of eight closely interacting (CLO) pairs of spiral galaxies that have overlapping disks and show enhanced far-infrared (FIR) emission. The goal is to study the star formation distribution in CLO pairs, with special emphasis on the role of 'overlap starbursts'. Observations were made with the Infrared Space Observatory (ISO) using the CAM and SWS instruments. The ISO CAM maps, tracing the MIR emission of warm dust heated by young massive stars, are compared to new ground based Hα and R-band images. We identify three possible subgroups in the sample, classified according to the star formation morphology: (1) advanced mergers (Arp 157, Arp 244 and Arp 299), (2) severely disturbed systems (Arp 81 and Arp 278), and (3) less disturbed systems (Arp 276, KPG 347 and KPG 426). Localized starbursts are detected in the overlap regions in all five pairs of subgroups (1) and (2), suggesting that they are a common property in colliding systems. Except for Arp 244, the 'overlap starburst' is usually fainter than the major nuclear starburst in CLO pairs. Star formation in 'less disturbed systems' is often distributed throughout the disks of both galaxies with no 'overlap starburst' detected in any of them. These systems also show less enhanced FIR emission, suggesting that they are in an earlier interaction stage than pairs of the other two subgroups where the direct disk collisions have probably not yet occurred.

of ISAS and NASA.


ARP157−N1
[NeII]
2.0×10−17
1.5×10−17
1.0×10−17
5.0×10−18
0
−5.0×10−18
Intensity (w/cm^2/um)
12.75
12.80
12.85
12.90
12.95
13.00
13.05
Wavelength (um)


ARP157−N1
4.0×10−18
3.0×10−18
2.0×10−18
1.0×10−18
0
Intensity (w/cm^2/um)
H2
DI
17.05
17.10
17.15
17.20
17.25
Wavelength (um)


ARP157-0V
[NeII]
8×10^-18
6×10^-18
4×10^-18
2×10^-18
0
-2×10^-18
Intensity (w/cm^2/um)
12.80
12.85
12.90
12.95
13.00
13.05
Wavelength (um)